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(54) Recording medium for storing linking type information

Aufzeichnungsträger zur Aufzeichnung von Verbindungsinformation

Support d'enrégistrement pour enrégistrer des informations du genre liaisons

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- **"Standard ECMA-279: 80 mm and 120 mm DVD-Recordable Disk (DVD-R)" December 1998 (1998-12) , ECMA: STANDARDIZING INFORMATION AND COMMUNICATION SYSTEMS XP002168576 * page 26 - page 27; figures 22,23 * * page 33 - page 34; figures 29-31 ***

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Description

[0001] The present invention relates to the field of optical recording media having continuous recording units, and more particularly, to a recording medium for storing linking type information which indicates whether a linking scheme applies to an area immediately after a defective area.

[0002] Since recording units of a digital versatile disc-rewritable (DVD-RW) and a digital versatile disc-recordable (DVD-R) are positioned continuously, contrary to those of a DVD-Random Access Memory (DVD-RAM) which are divided by physical identifier (PID) areas or buffer fields (extra areas allocated to correspond to a requirement for controlling a spindle motor accurately), it is required that a recording-start point of each recording unit in a DVD-RW is precisely located. The recording unit of the DVD-RAM can be a sector and the recording unit of the DVD-RW can be an error correction code (ECC) block.

[0003] Since the recording units of the DVD-R and the DVD-RW, which have the same physical formats, are positioned continuously as described above, for an incremental recording mode, that is, the mode in which data transmission is momentarily discontinued or new data is recorded following the previous data, the DVD-R and the DVD-RW use a linking scheme in which a predetermined number of bytes (for example, 3 bytes) of a next recording-start point are allocated as a linking area. In addition, there are two linking area sizes which are applied in incremental recording; 2 kilobytes and 32 kilobytes.

[0004] In the case of DVD-RW, when a defective area is registered in a defective area list which is registered in a recording management data (RMD) area, the DVD-RW uses a restricted overwrite recording mode along with the linking scheme similar to the incremental recording mode when recording actual user data after the registered defective area. Therefore, the current DVD-RW specification only applies a linking scheme for the incremental recording mode and the restricted overwrite recording mode. The DVD-RW specification does not define specific linking schemes for processing a defective area, such as defining a linking area after a defective area.

[0005] Figure 1 is a diagram illustrating a linking scheme which occurs in a general incremental recording mode, and shows old data 4, a 32-kilobyte linking area 2 and new data 7. Referring to Figure 1, when recording of old data 4 is completed without filling up a recording unit (an ECC block unit in Figure 1), padding data 5 is recorded from the remaining portion of the recording unit, where no data is recorded, to a first sector after a sync mark 1. Recording of the new user data 7 begins after recording linking data 6 in the 32-kilobyte linking area 2 for incremental recording.

[0006] In the meantime, in a case where reference signals such as a wobble signal or a land pre-pit (LPP) signal are not generated as in the case of an uncorrectable error, that is, in a case where a large defect exists across a plurality of tracks, all signals (a wobble signal, an LPP signal, etc.) are not generated at all when a pick-up unit passes through the defective area. In this case, continuous recording becomes impossible, and, since data must be recorded after the defective area, the same mode as an incremental recording mode is applied.

[0007] In a DVD-RW, data is recorded in groove tracks, and information which indicates physical ECC block numbers is recorded in the form of pre-pits in land tracks and referred to as the LPP signal. In addition, groove tracks are wobbled with a predetermined frequency.

[0008] Therefore, it is necessary to define a new linking scheme, since as described above currently after the defective area a linking scheme occurs which is defined only for a general incremental recording mode or a restricted overwrite recording mode. Since the linking scheme defined by the DVD-RW specification applies to only an incremental recording mode and a restricted overwrite recording mode, the new linking scheme would apply to an area immediately after the defective area.

[0009] The type of linking immediately after the defective area needs to be distinguished from the type of linking used in the general incremental recording mode and the restricted overwrite recording mode. That is, the linking in the general incremental recording mode and the restricted overwrite recording mode occurs when new data is recorded after stopping the recording of as much data as can be recorded at a time. This linking is not defined in a write-at-once recording mode.

[0010] "Standard ECMA-279: 80mm and 120mm DVD-Recordable Disk (DVD-R)" December 1998 (1998-12), ECMA: STANDARDIZING INFORMATION AND COMMUNICATION SYSTEMS XP002168576 discloses on pages 26/27 and 33/34 thereof figures showing identification data, sector information of the identification data, structure of linking and structure of ECC blocks.

[0011] However, according to the present invention the linking occurs immediately after the defective area, and occurs in a situation in which recording data as much as can be recorded at a time is not completely performed.

[0012] Therefore, it is an aim of embodiments of the present invention to provide a recording medium for storing linking type information which indicates whether linking occurs immediately after a defective area, in the recording medium in which recording units are positioned continuously.

[0013] It is another aim to provide a recording medium in which a predetermined number of error correction code (ECC) blocks, which have the same effect as a linking area, are allocated immediately after a defective area, in the recording medium in which recording units

are positioned continuously.

[0014] Additional aims of embodiments of the invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the invention.

[0015] According to an aspect of the invention, there is provided a recording medium having a plurality of continuous recording units, the recording medium comprising: a defect management area registering a list of defective areas; a linking area allocated immediately after one of the defective areas according to a predetermined linking scheme; and a predetermined area storing additional information indicating which predetermined linking scheme is applied to the linking area immediately after the one defective area.

[0016] The additional information may comprise a first type information indicating whether linking occurs in one of an incremental recording mode and a restricted overwrite recording mode, and a second type information indicating whether linking occurs immediately after the defective area.

[0017] The additional information may be stored in one of the recording units.

[0018] The recording medium may further comprise a data identification area storing the additional information.

[0019] The data identification area may comprise a sector information area, and the additional information is stored using a reserved bit in the sector information area.

[0020] Preferably an optical power source emitting a write power beam during recording user data lowers the write power beam upon detecting the defective area so that the lowered power beam does not affect recording on the recording medium.

[0021] Two or 32 kilobytes may be allocated to the linking area allocated immediately after the defective area.

[0022] Preferably, during certification before recording user data, linking data is recorded in advance in the linking area allocated immediately after the defective area.

[0023] The recording medium may further comprise a data identification area included in a sector of the recording medium where the defective area is located and store linking type information indicating that linking occurs immediately after the defective area and data type information indicating that the linking data is recorded in the linking area.

[0024] Padding data may be recorded in advance during the certification in one of the recording units immediately before the defective area.

[0025] The linking scheme applied to the defective area may be applied to each of a write-at-once recording mode, a restricted overwrite recording mode, and an incremental recording mode when the recording media is a digital versatile disc-rewritable (DVD-RW) disk.

[0026] For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings in which:

Figure 1 illustrates a linking scheme occurring in a general incremental recording mode;

Figure 2 illustrates an example of a method of processing defective area according to the present invention;

Figure 3 illustrates the structure of a data identification (DID) area as an example of storing linking type information according to the present invention; and

Figure 4 illustrates another example of a method of processing defective area according to the present invention.

Figure 5 is a block diagram of an embodiment of a recording/reproducing apparatus for implementing the present invention.

[0027] Reference will now be made in detail to the present preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below in order to explain the present invention by referring to the figures.

[0028] Figure 2 illustrates an example of a method of processing the defective area according to the present invention. During certification, after registering a defect list in a recording management data (RMD) area, a linking area is allocated after the defective area, and the new user data is recorded after the linking area.

[0029] The RMD area stores the list of defective areas found while using the recording medium as well as the list of the defective areas found during certification. According to the present invention, the RMD area stores the list of the defective areas found before or during recording of the user data. At the same time, for example, a data identifier (DID) area at the beginning of a sector (which can be the ECC block or the sector) where the defective data is included or located stores linking type information which indicates whether or not linking is applied after the defective area when recording the user data. Then, the new user data is recorded after applying a linking scheme to the area immediately after the defective area. In another example, the recording unit stores the linking type information as additional information, which indicates whether linking is applied immediately after the defective area and the linking type information can be referenced or accessed. Using the linking type information, the recording medium can recognize the linking data, thereby differentiating between the linking data and the user data.

[0030] That is, when the defective area 3, which is registered in the list of defective areas in the RMD area, is found while recording the user data 4, the defective area 3 is skipped without recording the user data. At this time, for the defective area 3, an optical power beam which is emitted from an optical power source such as a laser device is lowered down to a level that cannot affect recording, for example, under a read power beam. Therefore, an optical power source emitting a write power beam during recording the user data lowers the write power beam upon detecting the defective area 3 so that the lowered power beam does not affect recording. The linking area 8 immediately after the defective area 3 is filled with linking data 9, and the new data 7 begins to be recorded. The size of the linking area 8 occurring immediately after the defective area 3 may be either 2 KB or 32 KB, however, a size of 2KB is advantageous in real time read/write (RTRW) operation.

[0031] In the meantime, since linking according to embodiments of the present invention can be found through detection of the defective areas during certification, the linking data can be recorded in advance immediately after the detected defective area according to a predetermined linking scheme (2KB or 32KB). At this time, information is recorded in the data type information in the DID as shown in Figure 3 indicating that the linking data is recorded, and the linking type information indicating that linking occurs immediately after the defective area is recorded in the linking type information in the DID as shown in Figure 3.

[0032] Since padding data (for example, 00h) is recorded in the remaining portion of the recording unit, in a padding data area immediately before the defective area, when the recording unit is not filled up with the user data, the padding data can be recorded in advance in the recording unit immediately before the defective area. This padding data area can be overwritten when recording the actual user data.

[0033] When recording the user data after certification, the linking data is recorded in advance immediately after the defective area so that the user data can be recorded immediately after the linking area. Therefore, time for recording the linking data is shortened, and it is advantageous in real-time recording because the user data is recorded immediately after the defective area and the linking area.

[0034] Figure 3 illustrates an example of storing the linking type information according to the present invention in the DID area which is allocated for each sector and has 4 bytes. Data identification information includes sector information and a sector number, and sector information includes sector format type, tracking method, reflectivity, linking type, area type, data type, and layer number.

[0035] Sector format type information of bit position b31 represents constant linear velocity (CLV) or zone constant linear velocity (ZCLV) as follows.

0b: CLV format type

1b: Zoned format type, specified for Rewritable discs

[0036] Tracking method information of bit position b30 represents pit tracking or groove tracking as follows.

0b: Pit tracking

1b: Groove tracking, specified for Rewritable discs

[0037] Reflectivity information of bit position b29 represents whether reflectivity exceeds 40% or not as follows.

0b: If the reflectivity is greater than 40%

1b: If the reflectivity is less than or equal to 40%.

[0038] Area type information of bit position b27 and b26 represents a data area, a lead-in area, a lead-out area, or a middle area for a read-only disc as follows.

00b: In the data area

01b: In the Lead-in area

10b: In the Lead-out area

11b: In the middle area of read-only discs

[0039] Data type information of bit position b25 represents read-only data, or the linking data as follows.

0b: Read-only data

1b: Linking data

[0040] Layer number information of bit position b24 represents layer number in a single layer disc or a dual layer disc as follows.

0b: Layer 0 of dual layer discs or single layer discs

1b: Layer 1 of dual layer discs

[0041] According to embodiments of the present invention, linking type information is defined as follows and recorded, by using b28 which is a reserved bit in the sector information area in conventional methods.

0b: Linking for incremental recording

1b: Linking after defective area

[0042] If the linking type information is binary number "0", it indicates linking for the incremental recording

mode, and if it is binary number "1", it indicates linking immediately after the defective area. Here, the linking type which occurs in the incremental recording mode or the restricted overwrite recording mode can be referred to as linking type I, and the linking type which occurs immediately after the defective area can be referred to as linking type II.

[0043] Therefore, by indicating the linking type in the linking type information of the DID, the general linking type and the linking type according to the present invention can be distinguished. If information indicating linking immediately after the defective area is included in the DID of the sector in which linking occurs, when linking occurs in the sector it can be shown whether the linking occurred during the incremental recording mode, or the restricted overwrite recording mode, and whether the linking occurred immediately after the defective area. In addition, the linking type information can be used for high-speed data processing in a drive since with the linking type information it can be shown at once whether recording data is continuously recorded or divided by the defective area.

[0044] The linking scheme which accompanies the defective area according to the present invention can be applied to all the recording modes of the DVD-RW, that is, the write-at-one recording mode, the restricted overwrite recording mode, and the incremental recording mode.

[0045] Figure 4 illustrates another example of a method of processing the defective area according to the present invention. Reference number 11 is a user data area where old data is recorded, reference number 12 is a defective ECC block, reference number 13 is a predetermined number of ECC blocks allocated immediately after the defective ECC block in order to have the same effect as the linking area, and reference number 14 is a user data area where new data is recorded.

[0046] By using an area equal to or larger than 1 ECC block (32KB) allocated immediately after the defective area detected in certification, the data area from which recording of the new data begins can be detected without using the linking scheme. At this time, the predetermined number of ECC blocks immediately after the defective area can be registered in the RMD area, and it can be defined that the new user data area follows the predetermined number of ECC blocks immediately after the defective area according to a predetermined rule.

[0047] In addition, for high speed seek, a reference signal such as a test signal, data or a recording mark which has predetermined patterns, which takes a role of linking data can be recorded in advance in the predetermined number of ECC block area immediately after the defective area.

[0048] In recording the actual user data after certification, after a defective area is encountered or met, it is determined whether, for example, a test signal is detected. If the test signal is detected in the ECC blocks, which are allocated immediately after the defective area to have the same effect as the linking area, the new data recording begins in the new user data area immediately after the predetermined number of ECC blocks following the defective area, which is advantageous in real-time recording. Since a groove track can be wobbled, the test signal can also be a wobble signal.

[0049] As described above, in addition to the linking which occurs in incremental recording or restricted overwrite recording embodiments of the present invention use linking type information which indicates that linking occurs immediately after the defective area. By doing so, even if a large defect occurs in the recording medium and the reference signals required for recording/reproducing are not generated, the linking scheme can be applied to the area immediately after the defective area, and the new user data recording can begin, which increases reliability of the user data, and performs more reliable reproduction.

[0050] Further, according to such embodiments of the present invention, a reference signal such as a test signal, data, a groove wobble pattern, or a recording mark which has a test pattern, which functions as linking data is recorded in advance in a block immediately after the defective area detected during certification. If, for example the test signal is detected after the defective area, the new user data is recorded immediately after the predetermined number of ECC blocks following the defective area without using linking, reducing the time for recording linking data, which is advantageous to real-time recording.

[0051] Further, a playback apparatus reads information recorded according to the teachings of the present invention.

[0052] Further, Fig. 5 is an embodiment of a block diagram of a recording/reproducing apparatus for implementing the present invention. The function of the recording/reproducing apparatus for recording/reproducing A/V (audio/video) data using the recordable and rewriteable recording media such as the DVD-RW, DVD-R and DVD-RAM is largely divided into recording and reproduction.

[0053] During recording, an AV codec and/or a host interface 110 compression-codes an externally applied AV signal according to a predetermined compression scheme and supplies size information for the compressed data. A digital signal processor (DSP) 120 receives the compressed A/V data supplied from the AV codec and/or the host interface 110, adds additional data for error correction code (ECC) processing thereto, and performs modulation using a predetermined modulation scheme. A radio frequency amplifier (RF AMP) 130 converts the modulated data from the DSP into a radio frequency (RF) signal. Then, a pickup 140 records the RF signal supplied from the RF AMP 130 on a disk mounted on a turn table of the pickup 140. A servo unit 150 receives information necessary for servo control from a system controller 160 and stably performs a servo function for the mounted disk.

[0054] During playback of information data stored on the disk, the pickup 140 picks up the optical signal from the disk having the information data stored therein, and the information data is extracted from the optical signal. The RF AMP 130 converts the optical signal into an RF signal, and extracts the servo signal for performing a servo function, and modulated data. The DSP 120 demodulates the modulated data supplied from the RF AMP 130 corresponding to the modulation scheme used during modulation, performs an ECC process to correct errors, and eliminates added data. The servo unit 150 receives information necessary for servo control from the RF AMP 130 and the system controller 160, and stably performs the servo function. The AV codec and/or the host interface 110 decodes the compressed A/V data supplied from the DSP 120 to output an A/V signal. The system controller 160 controls the overall system for reproducing and recording the information data from and on the disk mounted on the turn table of the pickup 140.

[0055] The DSP 120 and the system controller 160 handle processing the data during recording and reproduction, including performing linking schemes in connection with recording and reproducing as well as performing linking schemes when processing defective areas on the media during recording and reproducing. That is, while recording the user data after certification, the system controller 160 recognizes one of defective area registered in list of defected areas and controls recording the user data processed by DSP 120 immediately after the linking area (specified by a predetermined linking scheme) following the one defective area.

Claims

1. A recording medium having a plurality of continuous recording units, the recording medium comprising:

   a defect management area registering a list of defective areas;

   a linking area allocated immediately after one of the defective areas according to a predetermined linking scheme; and

   a predetermined area storing additional information indicating which predetermined linking scheme is applied to the linking area immediately after the one defective area.

2. The recording medium of claim 1, wherein the additional information comprises a first type information indicating whether linking occurs in one of an incremental recording mode and a restricted overwrite recording mode, and a second type information indicating whether linking occurs immediately after the defective area.

3. The recording medium of claim 1 or 2, wherein the additional information is stored in one of the recording units.

4. The recording medium of claim 1, 2 or 3 further comprising a data identification area storing the additional information.

5. The recording medium of claim 4, wherein the data identification area comprises a sector information area, and the additional information is stored using a reserved bit in the sector information area.

6. The recording medium of any of claims 1 to 5, wherein an optical power source emitting a write power beam during recording user data lowers the write power beam upon detecting the defective area so that the lowered power beam does not affect recording on the recording medium.

7. The recording medium of any of claims 1 to 6, wherein 2 kilobytes are allocated to the linking area allocated immediately after the defective area.

8. The recording medium of any preceding claim, wherein 32 kilobytes are allocated to the linking area allocated immediately after the defective area.

9. The recording medium of claim 1, wherein, during certification before recording user data, linking data is recorded in advance in the linking area allocated immediately after the defective area.

10. The recording medium of claim 9, further comprising a data identification area included in a sector of the recording medium where the defective area is located and stores linking type information indicating that linking occurs immediately after the defective area and data type information indicating that the linking data is recorded in the linking area.

11. The recording medium of claim 9 or 10, wherein padding data is recorded in advance during the certification in one of the recording units immediately before the defective area.

12. The recording medium of any preceding claim, wherein the linking scheme applied to the defective area is applied to each of a write-at-once recording mode, a restricted overwrite recording mode, and an incremental recording mode when the recording media is a digital versatile disc-rewritable (DVD-RW) disk.

13. A recording medium having a plurality of continuous recording units, the recording medium comprising:

    a predetermined number of error correction

code (ECC) blocks allocated to an area immediately after a defective area detected during certification; and

a defective management area registering in a list the defective area and information on the predetermined number of ECC blocks allocated immediately after the defective area.

14. The recording medium of claim 13, wherein the predetermined number of ECC blocks after the defective area is predetermined according to a predetermined rule.

15. The recording medium of claim 13 or 14, further comprising a test signal as a reference signal recorded in advance in the predetermined number of ECC blocks immediately after the defective area.

16. The recording medium of claim 13, further comprising a wobble signal of a groove track as a reference signal recorded in advance in the predetermined number of ECC blocks immediately after the defective area, wherein when user data is recorded after the certification, recording of the user data begins immediately after the predetermined number of ECC blocks following the defective area if the reference signal is detected in the predetermined number of ECC blocks following the detected defective area.

Patentansprüche

1. Aufzeichnungsmedium mit einer Vielzahl fortlaufender Aufzeichnungseinheiten, wobei das Aufzeichnungsmedium umfasst:

einen Defektverwaltungsbereich, der eine Liste defekter Bereiche registriert;

einen Anschlussbereich, der unmittelbar nach einem der defekten Bereiche entsprechend einem vorgegebenen Anschlussschema zugeordnet ist; und

einen vorgegebenen Bereich, der zusätzliche Informationen speichert, die anzeigen, welches vorgegebene Anschlussschema auf den Anschlussbereich unmittelbar nach dem einen defekten Bereich angewendet wird.

2. Aufzeichnungsmedium nach Anspruch 1, wobei die zusätzlichen Informationen einen ersten Typ Informationen, der anzeigt, ob Anschluss in einem Inkremental-Aufzeichnungsmodus oder einem Restricted-Overwrite-Aufzeichnungsmodus stattfindet, und einen zweiten Typ Informationen umfassen, der anzeigt, ob Anschluss unmittelbar nach dem defekten Bereich stattfindet.

3. Aufzeichnungsmedium nach Anspruch 1 oder 2, wobei die zusätzlichen Informationen in einer der Aufzeichnungseinheiten gespeichert sind.

4. Aufzeichnungsmedium nach Anspruch 1, 2 oder 3, das des Weiteren einen Datenidentifizierungsbereich umfasst, der die zusätzlichen Informationen speichert.

5. Aufzeichnungsmedium nach Anspruch 4, wobei der Datenidentifizierungsbereich einen Sektorinformationsbereich umfasst und die zusätzlichen Informationen unter Verwendung eines reservierten Bits in dem Sektorinformationsbereich gespeichert sind.

6. Aufzeichnungsmedium nach einem der Ansprüche 1 bis 5, wobei eine Quelle optischer Energie, die während des Aufzeichnens von Benutzerdaten einen Schreibenergiestrahl emittiert, den Schreibenergiestrahl beim Erfassen des defekten Bereiches absenkt, so dass der abgesenkte Energiestrahl Aufzeichnung auf dem Aufzeichnungsmedium nicht beeinflusst.

7. Aufzeichnungsmedium nach einem der Ansprüche 1 bis 6, wobei zwei Kilobyte dem Anschlussbereich zugeordnet sind, der unmittelbar nach dem defekten Bereich zugeordnet ist.

8. Aufzeichnungsmedium nach einem der vorangehenden Ansprüche, wobei 32 Kilobyte dem Anschlussbereich zugeordnet sind, der unmittelbar nach dem defekten Bereich zugeordnet ist.

9. Aufzeichnungsmedium nach Anspruch 1, wobei beim Bestätigen vor dem Aufzeichnen von Benutzerdaten Anschlussdaten im Voraus in dem Anschlussbereich aufgezeichnet werden, der unmittelbar nach dem defekten Bereich zugeordnet ist.

10. Aufzeichnungsmedium nach Anspruch 9, das des Weiteren einen Datenidentifizierungsbereich umfasst, der in einem Sektor des Aufzeichnungsmediums enthalten ist, in dem sich der defekte Bereich befindet, und der Anschlusstyp-Informationen, die anzeigen, dass Anschluss unmittelbar nach dem defekten Bereich stattfindet, und Datentypinformationen speichert, die anzeigen, dass die Anschlussdaten in dem Anschlussbereich aufgezeichnet sind.

11. Aufzeichnungsmedium nach Anspruch 9 oder 10, wobei Auffülldaten im Voraus während des Bestätigens in einer der Aufzeichnungseinheiten unmittelbar vor dem defekten Bereich aufgezeichnet wer-

den.

12. Aufzeichnungsmedium nach einem der vorangehenden Ansprüche, wobei das Anschlussschema, das auf den defekten Bereich angewendet wird, auf einen Write-At-Once-Aufzeichnungsmodus, einen Restricted-Overwrite-Aufzeichnungsmodus und einen Inkremental-Aufzeichnungsmodus angewendet wird, wenn das Aufzeichnungsmedium eine überschreibbare DVD (DVD-RW)-Platte ist.

13. Aufzeichnungsmedium mit einer Vielzahl fortlaufender Aufzeichnungseinheiten, wobei das Aufzeichnungsmedium umfasst:

eine vorgegebene Anzahl von Fehlerkorrekturcode (ECC)-Blöcken, die einem Bereich unmittelbar nach einem defekten Bereich zugeordnet sind, der beim Bestätigen erfasst wird; und

einen Defekt-Verwaltungsbereich, der in einer Liste den defekten Bereich und Informationen über die vorgegebene Anzahl von ECC-Blökken speichert, die unmittelbar nach dem defekten Bereich zugeordnet sind.

14. Aufzeichnungsmedium nach Anspruch 13, wobei die vorgegebene Anzahl von ECC-Blöcken nach dem defekten Bereich entsprechend einer vorgegebenen Regel vorgegeben ist.

15. Aufzeichnungsmedium nach Anspruch 13 oder 14, das des Weiteren ein Testsignal als ein Bezugssignal umfasst, das im Voraus in der vorgegebenen Anzahl von ECC-Blöcken unmittelbar nach dem defekten Bereich aufgezeichnet wird.

16. Aufzeichnungsmedium nach Anspruch 13, das des Weiteren ein Wobbel-Signal einer Groove-Spur als ein Bezugssignal umfasst, das im Voraus in der vorgegebenen Anzahl von ECC-Blöcken unmittelbar nach dem defekten Bereich aufgezeichnet wird, wobei, wenn Benutzerdaten nach dem Bestätigen aufgezeichnet werden, Aufzeichnung der Benutzerdaten unmittelbar nach der vorgegebenen Anzahl von ECC-Blöcken auf den defekten Bereich folgend beginnt, wenn das Bezugssignal in der vorgegebenen Anzahl von ECC-Blöcken auf den erfassten defekten Bereich folgend erfasst wird.

Revendications

1. Support d'enregistrement comprenant une pluralité de dispositifs d'enregistrement continu, le support d'enregistrement comportant :

une zone de gestion de défauts établissant une liste de zones défectueuses ;
une zone de liaison affectée juste après une des zones défectueuses conformément à un schéma de liaison prédéterminé ; et
une zone prédéterminée stockant des informations supplémentaires indiquant quel schéma de liaison prédéterminé est appliqué à la zone de liaison juste après la zone défectueuse.

2. Support d'enregistrement selon la revendication 1, dans lequel les informations supplémentaires comportent des informations d'un premier type indiquant si une liaison se produit dans un mode d'enregistrement incrémentiel ou un mode d'enregistrement à superposition limitée, et des informations d'un deuxième type indiquant si une liaison se produit juste après la zone défectueuse.

3. Support d'enregistrement selon la revendication 1 ou 2, dans lequel les informations supplémentaires sont stockées dans l'un des modules d'enregistrement.

4. Support d'enregistrement selon la revendication 1, 2 ou 3, comprenant en outre une zone d'identification de données stockant les informations supplémentaires.

5. Support d'enregistrement selon la revendication 4, dans lequel la zone d'identification de données comporte une zone d'informations sectorielles, et les informations supplémentaires sont stockées à l'aide d'un bit réservé dans la zone d'informations sectorielles.

6. Support d'enregistrement selon l'une quelconque des revendications 1 à 5, dans lequel une source de puissance optique émettant un faisceau de puissance d'écriture pendant l'enregistrement de données d'utilisateur affaiblit le faisceau de puissance optique au moment de la détection de la zone défectueuse de façon que le faisceau de puissance n'affecte pas l'enregistrement sur le support d'enregistrement.

7. Support d'enregistrement selon l'une quelconque des revendications 1 à 6, dans lequel 2 kilooctets sont affectés à la zone de liaison affectée juste après la zone défectueuse.

8. Support d'enregistrement selon l'une quelconque des revendications précédentes, dans lequel 32 kilooctets sont affectés à la zone de liaison affectée juste après la zone défectueuse.

9. Support d'enregistrement selon la revendication 1, dans lequel, pendant la certification qui précède l'enregistrement de données d'utilisateur, des don-

nées de liaison sont enregistrées à l'avance dans la zone de liaison affectée juste après la zone défectueuse.

10. Support d'enregistrement selon la revendication 9, comprenant en outre une zone d'identification de données figurant dans un secteur du support d'enregistrement où se trouve la zone défectueuse contenant des informations sur le type de liaison indiquant qu'une liaison se produit juste après la zone défectueuse et des informations sur le type de données indiquant que les données de liaison sont enregistrées dans la zone de liaison.

11. Support d'enregistrement selon la revendication 9 ou 10, dans lequel des données de remplissage sont enregistrées à l'avance pendant la certification dans l'un des modules d'enregistrement juste avant la zone défectueuse.

12. Support d'enregistrement selon l'une quelconque des revendications précédentes, dans lequel le système de liaison appliqué à la zone défectueuse est appliqué à chacun des modes d'enregistrement à écriture immédiate, d'enregistrement à superposition limitée et d'enregistrement incrémentiel si le support d'enregistrement est un disque numérique universel réinscriptible (DVD-RW).

13. Support d'enregistrement comprenant une pluralité de dispositifs d'enregistrement continu, le support d'enregistrement comportant :

    un nombre prédéterminé de blocs de codes de correction d'erreurs (ECC) affectés à une zone juste après une zone défectueuse détectée pendant la certification ; et
    une zone de gestion de défauts consignant sur une liste la zone défectueuse et des informations sur le nombre prédéterminé de blocs ECC affectés juste après la zone défectueuse.

14. Support d'enregistrement selon la revendication 13, dans lequel le nombre prédéterminé de blocs ECC après la zone défectueuse est prédéterminé conformément à une règle prédéterminée.

15. Support d'enregistrement selon la revendication 13 ou 14, comportant en outre comme signal de référence un signal de test enregistré à l'avance dans le nombre prédéterminé de blocs ECC juste après la zone défectueuse.

16. Support d'enregistrement selon la revendication 13, comportant en outre comme signal de référence un signal de vobulation d'une piste de sillon enregistré à l'avance dans le nombre prédéterminé de blocs ECC juste après la zone défectueuse, dans lequel, au moment d'enregistrer les données d'utilisateurs après la certification, l'enregistrement des données d'utilisateur débute juste après le nombre prédéterminé de blocs ECC qui suivent la zone défectueuse si le signal de référence est détecté dans le nombre prédéterminé de blocs ECC qui suivent la zone défectueuse détectée.

FIG. 1 (PRIOR ART)

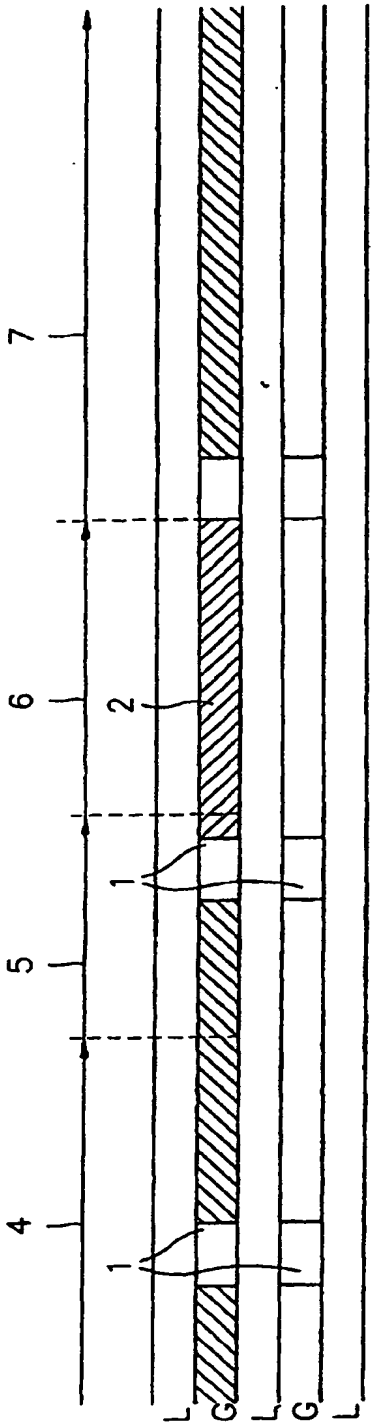


FIG. 2

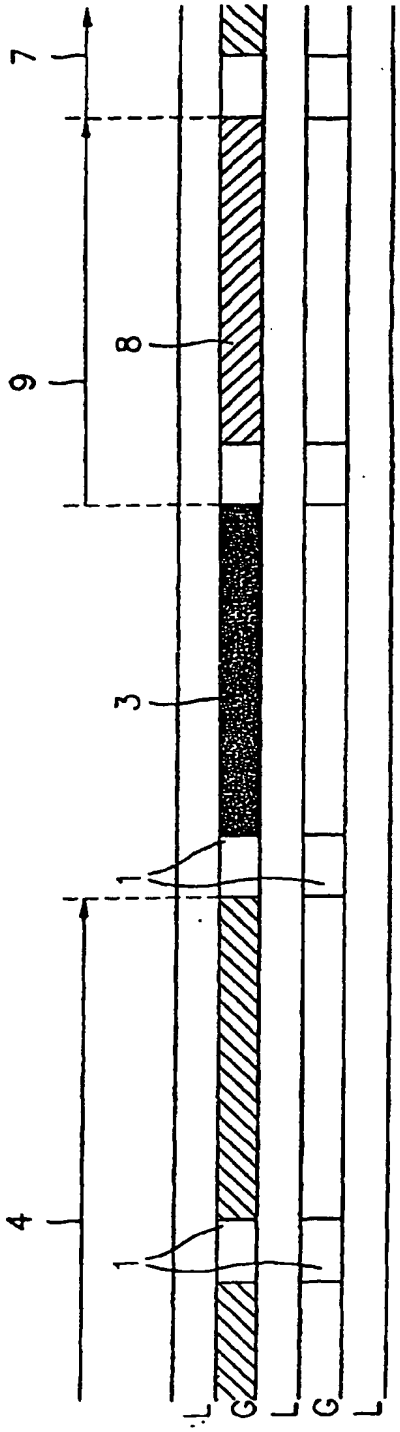


FIG. 3

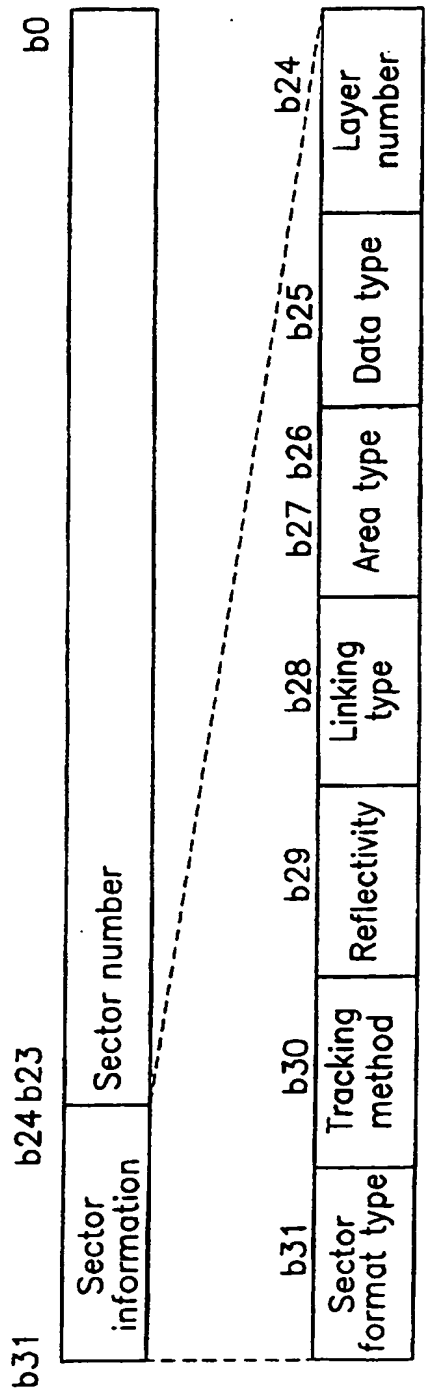

b0
b24
Layer number
b25
Data type
b26
b27
Area type
b28
Linking type
b29
Reflectivity
b30
Tracking method
b31
Sector format type
b24 b23
Sector information
Sector number
b31

FIG. 4

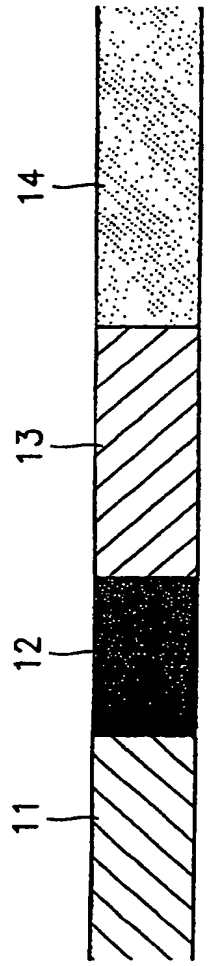
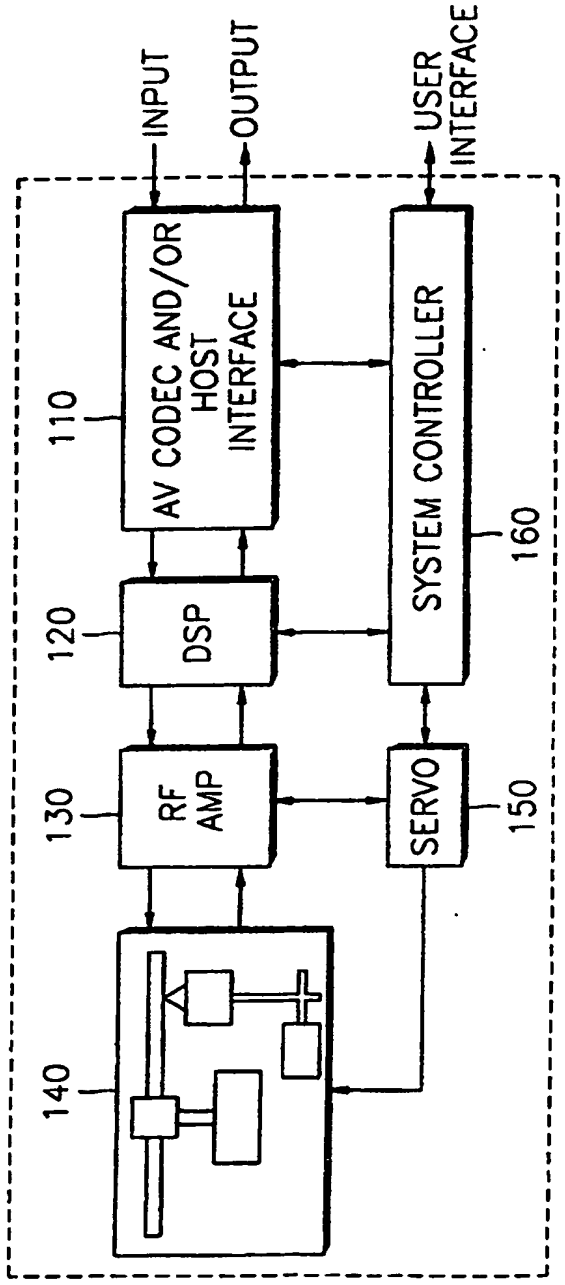

14
13
12
11

FIG. 5


INPUT
OUTPUT
USER INTERFACE
AV CODEC AND/OR HOST INTERFACE
110
DSP
120
RF AMP
130
140
SYSTEM CONTROLLER
160
SERVO
150